AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Currently Amended)** An optical waveguide to amplify optical signals in fiber-optic communications, the optical waveguide comprising:

at least one gain portion that provides a gain to one or more wavelengths in an optical signal; ~~and~~

~~at least one~~a first gain equalization filter portion that is optically coupled to the at least one gain portion; and

a second gain equalization filter portion that is optically coupled to the at least one gain portion, wherein:

the ~~at least one~~first gain equalization filter portion ~~selectively~~ attenuates ~~the one or more~~a first wavelength[s];

the second gain equalization filter portion attenuates a second wavelength; and

the first wavelength is different than the second wavelength, such that the gain of each wavelength in the optical signal is substantially equal~~, wherein a first one of the at least one gain portion is designed to provide a lower-level of amplification than a second one of the at least one gain portion~~.

2. **(Canceled)**

3. **(Canceled)**

4. **(Currently Amended)** The optical waveguide of claim 1, wherein the at least one gain portion and ~~the~~ at least one gain equalization filter portion are disposed in at least one of a single mode fiber, a multimode fiber and a double clad fiber.

5. **(Currently Amended)** The optical waveguide of claim 1, wherein ~~the~~ at least one gain equalization filter portion comprises a UV written Bragg grating in the optical waveguide.

6. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion comprises a mechanical perturbation of the optical waveguide.

7. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion comprises an electrically induced grating.

8. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion comprises an etched grating.

9. **(Canceled)**

10. **(Currently Amended)** The optical waveguide of claim 1, wherein the optical waveguide further comprises an inside core surrounded by a cladding, wherein ~~the~~ at least one gain equalization filter portion is formed in at least one of the inside core and the cladding.

11. **(Currently Amended)** The optical waveguide of claim 1, further comprising a doped portion that is doped with at least one of Erbium, Yb, Sm and Tm, wherein the doped portion includes at least one of the at least one gain portion and ~~the~~ at least one gain equalization filter portion.

12. **(Currently Amended)** The optical waveguide of claim 1, wherein ~~the~~ at least one gain equalization filter portion includes a plurality of discrete segments.

13. **(Withdrawn)** The optical waveguide of claim 1, wherein the at least one gain equalization filter portion includes a plurality of Gaussian shaped filters.

14. **(Canceled)**

15. **(Currently Amended)** The optical waveguide of claim 1 wherein the first and second ~~at least one~~ gain equalization filter portions selectively attenuate[[s]] the one or more wavelengths such the gain of each wavelength in the optical signal is within 2dB of each other wavelength in the optical signal.

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Canceled)

23. (Canceled)

24. (Canceled)

25. (Canceled)

26. (Canceled)

27. (Canceled)

28. (Canceled)

29. (Canceled)

30. (Canceled)

31. (Canceled)

32. (Canceled)

33. (Canceled)

34. (Canceled)

35. (Canceled)

36. (Canceled)

37. (Canceled)

38. **(Currently Amended)** The optical waveguide of claim 1, wherein the ~~at least one~~ gain equalization filter portions [[is]]are configured to filter input signals having a wavelength between 1530 nanometers and 1562 nanometers.

39. **(Canceled)**

40. **(Currently Amended)** The optical waveguide of claim 1, wherein ~~the~~a second gain section has a longer length than ~~the~~a first gain section.

41. **(Currently Amended)** The optical waveguide of claim 1, wherein the ~~at least one~~ first gain equalization filter portion is configured to pre-compensate the optical signal for gain non-uniformities before receiving gain from the second gain equalization filter portion within the optical waveguide.

42. **(Currently Amended)** The optical waveguide of claim 1, further comprising a doped portion that is doped with at least one of Sm and Tm, wherein the doped portion includes at least one of the at least one gain portion and the ~~at least one~~first and second gain equalization filter portions.

43. **(Canceled)**

44. **(Canceled)**

45. **(Canceled)**

46. **(Canceled)**

47. **(New)** The optical waveguide of claim 5, wherein the gain equalization filter portions include a series of Bragg gratings at different Bragg wavelengths.

48. **(New)** The optical waveguide of claim 47, wherein the series of Bragg gratings at different Bragg wavelengths are formed to create a composite loss characteristic to flatten the optical gain.

49. **(New)** The optical waveguide of claim 1, wherein the first gain equalization filter portion includes a slanted grating.

50. **(New)** The optical waveguide of claim 1, wherein the first gain equalization filter portion includes an unslanted grating.

51. **(New)** The optical waveguide of claim 1, wherein the first gain equalization filter portion includes a long period grating.

52. **(New)** The optical waveguide of claim 1, further comprising a first gain portion that provides a gain to a first wavelength in the optical signal, and a second gain portion that provides a gain to a second wavelength in the optical signal.

53. **(New)** The optical waveguide of claim 1, further comprising three gain sections coupled by the first and second gain equalization filter portions.

54. **(New)** The optical waveguide of claim 1, wherein a first gain portion is designed to provide a lower-level of amplification than a second gain portion.